TELEPHONE CALL INITIATION

This invention relates to the field of telephone call initiation. More particularly, this invention relates to telephone systems in which, in order to make use of a lower cost provider of telephone services, a user takes action to initiate a call using the lower cost service provider or a provider of a higher quality set of services rather than the default provider.

There is a considerable difference in the pricing of telephone services between different providers and different countries. This had led to the provision of systems in which a first party wishing to make a telephone call to a second party initially makes a telephone call to a low cost provider. The first party then gives details to the low cost provider identifying themselves (e.g. a user registration and PIN) together with the telephone number of the second party. In some systems the first party will then hang up and wait to be called back by the low cost provider, who is typically based in another country. For example, the low cost provider may provide the first party with a dialling tone such that they may dial the second party themselves.

The provision of such services relies upon the cooperation of the local (default) telephone provider since they are used to make the initial call to the low cost provider. In some cases, the local service provider may be uncooperative in the establishing of such systems since they hold a monopoly position and the low cost service provider represents a competitor. Accordingly, there exists a technical problem of how telephone users may pass details of themselves and the calls they wish to make to the low cost provider without the cooperation of the local service provider. Furthermore, the provision of access mechanisms with local providers on a world-wide basis is a considerable cost and inconvenience leading to a considerable market entry barrier.

In addition to the above problem, there is also a considerable degree of inconvenience associated with having to read out (e.g. when setting up conference calls) or key in via a tone telephone all of the information required to specify the telephone call that is to be made. This is a considerable deterrent to the use of such services except in those circumstances involving particularly expensive telephone calls in which the difference in price provides sufficient motivation to the user.

Viewed from one aspect the present invention provides apparatus for establishing a telephone connection between a first party and a second party, said

apparatus comprising:

a client computer terminal controlled by said first party, said client computer terminal being responsive to input by said first party to generate a telephone call specifying message;

server computer apparatus remote from and connectable to said client computer terminal via a computer network link for receiving said telephone call specifying message; and

a telephone call initiator controlled by said server computer apparatus for dialling via a public telephone network a first telephone call to said first party as specified by said telephone call specifying message and performing one of:

(i) dialling a second telephone call via said public telephone network to said second party as specified by said telephone call specifying message and connecting said first telephone call and said second telephone call; and

(ii) establishing a dialling ready telephone link to said public telephone network and connecting said first telephone call to said dialling ready telephone link such that said first party may dial a call to said second party.

The invention recognises that a different mechanism may be used to pass the details of a telephone call to be made to a telecommunications service provider other than by using the telephone network itself. In particular, a great many users of telephone services also have immediate access to a computer that is either permanently or intermittently connected to a computer network, such as the Internet. A very high number of telephone calls are made by users sitting at desks that have both a computer that is connected (or is connectable) to the Internet and a telephone on which they wish to make calls. The computer on the user's desk can be used to generate a telephone call specifying messages that may be transmitted to a remote server via a computer network link with that remote server then operating, in conjunction with other hardware, to call back the user and dial the second party in the telephone connection or provide the initiator with a dialling tone such that they may dial the second party themselves. This mechanism for specifying the call to be made bypasses the need for cooperation from the local telephone service provider and also means that the data needed to specify each call may be more conveniently generated using the computer's abilities to store and retrieve data.

One potential problem is that the first party may not have a telephone that may be directly dialled by the low cost provider, e.g. within a company that has its own internal private exchange. In these circumstances, preferred embodiments are such that said telephone call specifying message includes announcement data that controls generation of a voice announcement to said first party upon answering of said first telephone call.

By including provision for the generation of a voice announcement when the first call is answered, this allows the system to be used in circumstances in which the telephone call is answered by a telephonist who must then connect the call to the first party. The voice announcement can be a simple message specified by the first party instructing the telephonist to connect the call to the first party. Whilst initially this may be unfamiliar to a telephonist, after a short while they will immediately recognise what is occurring and connect the call to the first party.

The same problem does not arise with the second party, since the first party is by then connected and may themselves speak to whoever answers the telephone for the second party and request any further connection as necessary.

It would be possible for the first party to record a sampled voice announcement message for use in the above circumstances, but this would consume a large amount of data storage capacity if it were to be of an acceptable length and quality that would either require a disadvantageously large amount of time to transmit on each occasion from the client computer terminal to the server computer apparatus or would consume a disadvantageously large amount of storage space upon the server computer apparatus. Accordingly, it is preferred that said announcement data is text data and said server computer apparatus includes a text to voice convertor for converting said text data into said voice announcement.

Whilst text to voice converters are still not particularly natural sounding, they are more than capable of generating an understandable message to enable the appropriate connection back to the first party. This is particularly the case since the telephonist or the like who will be answering the call will soon recognise the artificial voice and become accustomed to understanding the message being given. This capability also allows for the possibility of the provision of messages in different languages to be specified by the first party who may not themselves speak that

different language.

The invention is also highly useful in the provision of other premium rate telephone services. More particularly, the invention may be used in systems in which said apparatus establishes a conference telephone connection between at least said first party, said second party and a further party, said telephone call initiator being controlled by said server computer apparatus to perform for said further party one of:

(i) dialling a further telephone call via said public telephone network to said further party as specified by said telephone call specifying message and connecting said first telephone call, said second telephone call and said further telephone call; and

(ii) establishing a dialling ready telephone link to said public telephone network and connecting said first telephone call to said dialling ready telephone link such that said first party may dial a call to said further party.

The provision of conference call facilities has typically previously required the first party to purchase special purpose hardware themselves or has required an expensive and inconvenient arrangement for the use of such hardware to be made with the local service provider. The ability of the telephone call initiator of the present invention to establish telephone calls and then interconnect them enables it to be readily extended to the provision of conference calls in which three or more parties are simultaneously connected. This avoids the user from having to purchase special purpose hardware and enables such conference calls to be organised by the low cost call provider.

It will be appreciated that the server computer apparatus could be provided in a very different location to the first party and the second party. Frequently, the first party, the second party and the server computer apparatus will all be in different countries. International calls are generally the most expensive to make and accordingly are the ones in which the present invention is most useful. Depending upon the particular call to be made, it may be possible that the best telephone connection route will change. Accordingly, in preferred embodiments of the invention said server computer apparatus comprises a plurality of separately located server computers with associated telephone call initiators, said server computer apparatus being responsive to said telephone call specifying message to select one of said plurality of separately located server computers and telephone call initiators to

establish said telephone connection.

Thus, for example, all telephone call specifying messages may be routed to a central server that then selects one of a plurality of further servers to which the individual messages may be forwarded (e.g. because that server is located in the most cost effective country for a particular call or for another commercial reason) and then acted upon by an associated telephone call initiator.

Whilst it is possible that the computer network link could take many forms, it is preferable by virtue of its widespread use and acceptance that the computer network link is a TCP/IP Internet link.

In order to reduce the running costs of the system, it is preferred that said server computer apparatus electronically bills said first party for said telephone connection using first party billing information stored by said server computer apparatus.

It will be appreciated that the international nature of the telephone system is such that the various portions of the system described above may in fact be located in different countries. Any one country would thus contain only a part of the system described above.

Viewed from another aspect the invention provides apparatus for establishing a telephone connection between a first party and a second party, said apparatus comprising:

a client computer terminal controlled by said first party, said client computer terminal being responsive to input by said first party to generate a telephone call specifying message, said client computer terminal being connectable to server computer apparatus remote from said client computer terminal via a computer network link, said server computer apparatus receiving said telephone call specifying message via said computer network link;

wherein said telephone call specifying message includes control signals that are used by said server computer apparatus to control a telephone call initiator to dial via a public telephone network a first telephone call to said first party as specified by said telephone call specifying message and perform one of:

(i) dialling a second telephone call via said public telephone network to said second party as specified by said telephone call specifying message and connecting

said first telephone call and said second telephone call; and

(ii) establishing a dialling ready telephone link to said public telephone network and connecting said first telephone call to said dialling ready telephone link such that said first party may dial a call to said second party.

Viewed from a further aspect the invention provides apparatus for establishing a telephone connection between a first party and a second party, said apparatus comprising:

server computer apparatus remote from and connectable to a client computer terminal via a computer network link for receiving a telephone call specifying message, said client computer terminal being responsive to input by said first party to generate said telephone call specifying message; and

a telephone call initiator controlled by said server computer apparatus for dialling via a public telephone network a first telephone call to said first party as specified by said telephone call specifying message and performing one of:

(i) dialling a second telephone call via said public telephone network to said second party as specified by said telephone call specifying message and connecting said first telephone call and said second telephone call; and

(ii) establishing a dialling ready telephone link to said public telephone network and connecting said first telephone call to said dialling ready telephone link such that said first party may dial a call to said second party.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 illustrates a system for establishing a telephone connection between a first party and a second party;

Figure 2 illustrates a potential geographical distribution of the system illustrated in Figure 1;

Figure 3 is a flow diagram illustrating the operation of the system of Figure 1;

Figure 4 illustrates a diagram schematically illustrating the establishing of a conference call; and

Figures 5 to 8 illustrate data flows in the operation of the system of Figure 1.

Figure 1 illustrates the situation in which a first party wishes to make a

telephone connection to a second party. The first party uses a client computer terminal 2 to generate a telephone call specifying message TCSM that includes information such as a user identifier, a PIN and the telephone number of the second party. The client computer terminal 2 is connected via a local area network 4 and a bridge 6 to an Internet service provider 8 (point of presence). The telephone call specifying message TCSM is passed from the client computer terminal 2 to the Internet service provider 8 from where it is transmitted using the TCP/IP protocol and the Internet to a server computer apparatus 10 (SCA).

The computer server apparatus 10 is connected to a telephone call initiator 12. The telephone call initiator 12 is controlled by the server computer apparatus 10 to make a first call (FC) to the first party. This first call FC is routed via an international exchange 14 and a local exchange 16 to the private exchange 18 associated with the first party. When this private exchange 18 answers the call, the server computer apparatus 10 plays a voice announcement requesting connection to the telephone extension of the first party. This announcement can be repeated until an acknowledgement of the connection to the first party is received (such as the pressing of a predetermined tone dial key) or the system times out.

Once the first call has been established, the call initiator 12 then dials the telephone number of the second party and connects the telephone line of the first party to that of the second party. When the second party answers the telephone, the first party is available to request the appropriate person to whom to speak.

As an alternative to the call initiator 12 dialling the second party, the call initiator may instead connect the first party to an external public telephone network line such that a dialling tone is provided to the first party to enable the first party to dial the telephone number of the second party and thus make the connection (i.e. provide a dialling ready link).

During the above process, the server computer apparatus 10 and the telephone call initiator 12 exchange signals that enables the server computer apparatus 10 to pass messages back to the client computer terminal 2 via the Internet link reporting the progress being made in establishing the desired telephone connection.

Figure 2 schematically illustrates an example of the potential geographical positioning of the various parties. In this example, the first party is located in Great

Britain, the server computer apparatus 10 and the telephone call initiator 12 are located in the United States of America and the second party is located in Japan. Accordingly, only the client computer terminal 2 is present in Great Britain and only the server computer apparatus 10 and the telephone call initiator 12 is present in the United States of America. It is possible for the server computer apparatus 10 to comprise a plurality of separate server computers to which the telephone call specifying message TCSM may be forwarded if that server computer and associated telephone call initiator are able to service the telephone connection required more effectively/less expensively.

Figure 3 illustrates the stages of the operation of the system shown in Figure 1. At step 20 the first party enters data specifying the desired telephone connection. The user identification data (and optionally any associated PIN) can be permanently stored within the client computer terminal 2 and appended to the entered data prior to transmission to the server computer apparatus 10 at step 22.

At step 24 the server computer apparatus 10 validates the received telephone call specifying message TCSM. In particular, the server computer apparatus 10 checks the user identifier/PIN for a current valid charging arrangement. If the TCSM fails the validation, then the process terminates at step 26. If the TCSM passes the validation, then the telephone call initiator 12 makes the first call to the first party (and optionally transmits the voice announcement when this first call is answered) at step 26. Step 28 checks to see if the first call has been answered within a predetermined period. If the first call is not so answered, then the process times out and is terminated at step 26.

At step 30 the telephone call initiator 12 makes the second call to the second party. Providing this second call is answered before it is timed out by step 32, then the first call and the second call are connected by the telephone call initiator 12 at step 34. At the end of the telephone call, the server computer apparatus 10 generates an electronic bill (e.g. an automatic debit to a credit card account) at step 36.

Figure 4 schematically illustrates the system operating to establish a conference call between three parties. The operation of this system is similar to that described in relation to Figure 1 except that the telephone call specifying message TCSM includes data identifying both the telephone numbers of the second party and the third

party. The call initiator 12 is controlled by the server computer apparatus 10 to make a third call TC to the third party after the second call SC to the second party has been made and finally connect all three of the first call FC, the second call SC and the third call TC together to form a conference call when the third party answers.

There follows a functional specification of the above described system:

SYSTEM OVERVIEW

Introduction

The system allows a user to initiate low-price telephone calls, conference calls, and other telephony services using a computer which is connected to the Internet.

System Description

This is a client server based system and works by connecting the user's client application to a server application which establishes the telephone calls. The client server link is established over the Internet using TCP/IP. The server makes the telephone calls using known telephony hardware such as a modem, PBX or other dialling hardware (e.g. as manufactured by companies such as Harris Digital Telephone Corporation of California or Northern Telecom (NorTel)).

The advantages of this method of establishing telephony services include low cost (due to the fact that the server/dialling hardware can, due to geographical and/or commercial arrangements, complete the calls at costs less than those appertaining to the user in their location). The cost of sending the information required to establish this call is simply the cost of connecting to a local Internet service provider. The infrastructure of the Internet is thus used as a means of establishing standard telephony services, such as telephone calls, conference calls and a wide range of added value facilities.

Process Definitions

Registration

An interactive process where the user sends personal information including credit card details to the server to obtain an ID code and a PIN code.

Dial

An interactive process where the user sends the telephone numbers and the PIN code to the server to initiate a call.

Unregistration

An interactive process where the user sends the User ID Code and the PIN code to the server to get unregistered on the server.

External Dependencies

- TCP/IP stack
- Dialler hardware - PBX, modem etc.
- Text to voice application
- Encryption and decryption applications

Glossary

This section explains some of the technical terms used in this section,

GUI	Graphical User Interface
PGP	Pretty Good Privacy, a public key encryption technology
RTF	Rich Text Format

System Detail

Data Flow Diagrams

See the Process Definitions Section below for process details.

Registration

See Figure 5

Dial

See Figure 6.

Unregistration

See Figure 7.

User Interface Screens

Whenever a user wants to enter numbers, the numeric buttons as well as the keyboard can be used.

The screen always shows which buttons are applicable at a certain point in time. A client main screen, a register new user dialog box, a select user dialog box, a telephone book dialog box, an add telephone number dialog box, a conference call dialog box and a PIN code dialog box (the PIN code is at least 4 digits) are all provided for user interaction in the various operational states of the client computer terminal 2.

During operation the client computer terminal 2 and the server computer

apparatus 10 exchange messages to allow progress to be displayed to the user, e.g.

Press Start to start server.
Initialize dialling hardware...
Waiting for client requests...
Incoming request from ABCDE at 123.45.678.1...
Dialling 0081351234567...
Speaking announcement...
Dialling 0035391987654...
Waiting for end of conversation...

Process Definitions

Registration

See Figure 5

1. User enters personal and credit card details and presses registration button.
2. Client sends details in the registration message to the server
3. Server checks if user exists and stores the details - the criteria for existence are name and credit card details.
4. If the user exists in the server database, the server requests the PIN code from the client user and sends back the User ID Code
5. Otherwise the server sends User ID Code and PIN code to the client (in a registration status message) and stores them as well.
6. Client stores User ID Code and shows PIN code on screen for the user to memorize.

This process can be repeated for different users on one installation.

Dial

See Figure 6

1. User specifies telephone numbers and announcement text and presses dial button
2. User enters PIN code
3. Client sends details in the dial message to the server
4. At this point the user has the option to terminate the Internet link between

client and server by pressing the disconnect button. This might be necessary in case the link was established through a telephone line that is needed in the call

- the dial process will continue and the server will not send status messages back to the client.

5. Server verifies user details

6. On failure: send status message to client and stop; if PIN code wrong three times in a row, mark user's credit card as locked

7. On success: establish conference call and send progress/status messages to the client:

8. First dial the user's number and speak the announcement text, if specified, using the text to voice application

9. Stop if no connection could be established to the user

10. Then dial the other numbers specified

11. If a telephone number is busy or unavailable, the dialling process skips this number and sends a status message to the client (the time out is fixed in the server); if a telephone number is busy, the number of retries is fixed.

12. Client shows status information on screen

13. If there are less than two members in the call, the call is automatically terminated.

14. The call can be terminated by the user (if it has not already terminated automatically) by pressing the hang up button; the client application sends a hang up message to the server, the server terminates the call and sends back a status message to the client, and the client shows status information on screen.

See Figure 8.

Unregistration

See Figure 7

1. User presses unregister button
2. User enters PIN code
3. Client sends unregister message to the server
4. Server clears user details and sends a status message to the client
5. Client shows status information on screen

Data Analysis

Data Flow Definitions

This section defines the data to be sent between client and server.

1. Registration message (client -> server)
   - Name
   - Address, postcode, city, country
   - Credit card details
2. Registration status message (server -> client)
   - Message status code
   - On success: User ID code (will be stored on client computer)
   - On success: PIN code (will not be stored on client computer)
3. Dial message (client -> server)
   - User ID code
   - 4 digit PIN code
   - Telephone number of selected user
   - List of selected telephone numbers
   - Announcement text
   - Language code
4. Unregistration message (client -> server)
   - User ID code
   - 4 digit PIN code
5. Status messages (server <-> client)
   - Message status code
   - Optional parameter string
6. Hang up message (client -> server)
   - Message status code

All messages include message codes which are listed in the Status and Message Codes Section below.

All messages are encrypted before they are sent

Data Storage Definitions

This section defines the data to be stored on client and server.

1. User details on client
   - Name

- User ID Code
- Telephone number

-Announcement text

2. Telephone book entries on client
   - Name
   - Telephone number
3. Details of registered users on server
   - Name
   - Address, postcode, city, country
   - Credit card details (encrypted)
   - User ID code
   - 4 digit PIN code (encrypted)
   - Number of times the PIN code was wrong in a row

Status and Message Codes

The main status and message codes are:

1. INVALID_MESSAGE, sent when a message received was not recognized by the client or server
2. REGISTER_MESSAGE, when user sends register message to the server
3. UNREGISTER_MESSAGE, when the user sends unregister message to the server
4. USER_REGISTERED, when new user successfully registered
5. USER_EXISTS + User ID Code, when user was already registered; this message also contains the User ID Code and the PIN code
6. ASK_PIN, when the server requests PIN code from the client user
7. PIN_CODE + PIN code, when the client sends the PIN code to the server
8. DIAL_MESSAGE, when user sends a dial message to the server
9. DIAL_USER, when the server instructs the dialling hardware (e.g. PBX, Modem, etc) to dial the user's number
10. DIAL_NUMBER + parameter, when the server dials the first, second, etc. telephone number
11. PIN_ERROR, when the PIN code typed in was incorrect
12. USER_ERROR, when the user did not exist in the server database

13. CREDIT_CARD_ERROR, when the credit card is expired

14. USER_CONNECTED + parameter, when client and user successfully connected and user data validated, specifying the server that the client is connected with

15. BUSY_REDIAL, when the number dialled by the server is busy (the server re-dials)

16. BUSY_SKIP, when the number dialled by the server is busy (the server skips this number)

17. NO_ANSWER_SKIP, when no answer at number dialled (the server skips this number)

18. CALL_ANNOUNCE, when the server text to voice application speaks the announcement

19. CALL_COMPLETE + parameter, when the conference call is complete with number of members

20. CALL_TIME + parameter, how long the conference call is currently going

21. CALL_MEMBERS + parameter, how many members are currently in the conference call

22. FORCE_HANGUP (client -> server), when the user presses the hang up button

23. SERVER_HUNGUP, when server terminated conference call

24. AUTO_HANGUP, when less than the minimum number of participants are left in the conference call.

These status and message codes are sent to the client, if not specified otherwise.

Environment

User Environment

The users of the client can be home users as well as business users.

If a user has an Internet firewall installed, a network administrator must set up a plug in the firewall in order to allow Internet traffic from the client to the server. If there were several servers that clients can connect into, the network administrator would need to set up plugs in the firewall for each server.

Hardware Environment

Typical hardware provisions required by the client include:

- Any 16-bit or 32-bit Windows (a trade mark of Microsoft Corporation), Macintosh (a trade mark of Apple Computer Corporation) or Unix hardware platform
- At least 5 MB of free hard disk space
- Optionally: an industry standard sound card, capable of playing sound effects.

Typical hardware provisions required by the server:

- Any 16-bit or 32-bit Windows, Macintosh or Unix compatible hardware platform
- At least 5 MB of free hard disk space
- An industry standard sound card to be used with text to voice software
- Industry standard dialling hardware connected to the server, so that dialling instructions can be passed from the server to the hardware

Software Environment

Typical provisions required by the client include:

- Microsoft Windows 3.11 or Windows NT version 3.51 or higher or Windows 95
- A running WINSOCK TCP/IP stack (a direct Internet or a dial up link)
- Optionally: audio drivers

By the server:

- Microsoft Windows 3.11 or Windows NT version 3.51 or higher or Windows 95
- A running WINSOCK TCP/IP stack, preferably a direct Internet link
- Audio drivers

Security

1. The Internet traffic between client and server consists of encrypted messages, preferably encrypted with PGP
2. Credit card details are not stored on the client PC (they have to be stored on the server and are encrypted).
3. Each time a user wants to initiate a new call, the correct PIN code for this user must be typed in.
4. If a user's PIN code is wrong three times in a row, the user's credit card is marked as locked and cannot be used any more.

Quality Specification

Ease of Use

The user is not expected to have an instruction card or guide for the use of the client. Use of the client software is intuitive so that no manuals or on-line help are required. Tooltips are shown over the function buttons a few seconds after the mouse pointer is held over them. The "LCD screen" on the main screen informs the user about the status of the client server connection and the dialling progress. It also displays help on applicable buttons if the user did not press any buttons for about five seconds.

Maintainability

The following requirements are intended to make the software easy to maintain:

The client and server software is written in Visual Basic Version 4 with a Microsoft Windows interface.

Reliability

The client and server software is available for on-demand use at all times.

Reliability of data (accuracy of information) within the client is the responsibility of the users. There is nothing the user can type or click on which causes the client to terminate abnormally. On error, a descriptive error message explaining the probable cause of error is displayed. System error messages are displayed to the user without editing or interpretation. Network termination does not cause client or server to terminate abnormally.

Client and server carry out consistency checks and inform the user if any inconsistencies exist.

Compatibility

Client and server GUI's and dialog boxes can be fully displayed and are compatible with VGA mode monitors and better.

Client and server are 16-bit applications, able to run on new as well as old Windows platforms.

Other Features

The server is programmed so that it is possible for it to cater for multiple client requests at a time.

The server is programmed to incorporate a databases with customer

information.

The client is programmed to flexibly connect to different servers.

The client is programmed to add conference call participants during a running conference call.

CLAIMS

1. Apparatus for establishing a telephone connection between a first party and a second party, said apparatus comprising:

a client computer terminal controlled by said first party, said client computer terminal being responsive to input by said first party to generate a telephone call specifying message;

server computer apparatus remote from and connectable to said client computer terminal via a computer network link for receiving said telephone call specifying message; and

a telephone call initiator controlled by said server computer apparatus for dialling via a public telephone network a first telephone call to said first party as specified by said telephone call specifying message and performing one of:

(i) dialling a second telephone call via said public telephone network to said second party as specified by said telephone call specifying message and connecting said first telephone call and said second telephone call; and

(ii) establishing a dialling ready telephone link to said public telephone network and connecting said first telephone call to said dialling ready telephone link such that said first party may dial a call to said second party.

2. Apparatus as claimed in claim 1, wherein said telephone call specifying message includes announcement data that controls generation of a voice announcement to said first party upon answering of said first telephone call.

3. Apparatus as claimed in claim 2, wherein said announcement data is text data and said server computer apparatus includes a text to voice convertor for converting said text data into said voice announcement.

4. Apparatus as claimed in any one of the preceding claims, wherein said apparatus establishes a conference telephone connection between at least said first party, said second party and a further party, said telephone call initiator being controlled by said server computer apparatus to perform for said further party one of:

(i) dialling a further telephone call via said public telephone network to said further party as specified by said telephone call specifying message and connecting said first telephone call, said second telephone call and said further telephone call; and

(ii) establishing a dialling ready telephone link to said public telephone network and connecting said first telephone call to said dialling ready telephone link such that said first party may dial a call to said further party.

5. Apparatus as claimed in any one of the preceding claims, wherein said server computer apparatus comprises a plurality of separately located server computers with associated telephone call initiators, said server computer apparatus being responsive to said telephone call specifying message to select one of said plurality of separately located server computers and telephone call initiators to establish said telephone connection.

6. Apparatus as claimed in claim 5, wherein said computer server apparatus selects that server computer and telephone call initiator that can establish said telephone connection specified by said telephone call specifying message at lowest cost.

7. Apparatus as claimed in any one of the preceding claims, wherein said computer network link is an Internet link.

8. Apparatus as claimed in claim 7, wherein said Internet link is one of a TCP/IP link and a UDP link.

9. Apparatus as claimed in any one of the preceding claims, wherein said server computer apparatus electronically bills said first party for said telephone connection using first party billing information stored by said server computer apparatus.

10. Apparatus for establishing a telephone connection between a first party and a second party, said apparatus comprising:

a client computer terminal controlled by said first party, said client computer

terminal being responsive to input by said first party to generate a telephone call specifying message, said client computer terminal being connectable to server computer apparatus remote from said client computer terminal via a computer network link, said server computer apparatus receiving said telephone call specifying message via said computer network link;

wherein said telephone call specifying message includes control signals that are used by said server computer apparatus to control a telephone call initiator to dial via a public telephone network a first telephone call to said first party as specified by said telephone call specifying message and perform one of:

(i) dialling a second telephone call via said public telephone network to said second party as specified by said telephone call specifying message and connecting said first telephone call and said second telephone call; and

(ii) establishing a dialling ready telephone link to said public telephone network and connecting said first telephone call to said dialling ready telephone link such that said first party may dial a call to said second party.

11. Apparatus for establishing a telephone connection between a first party and a second party, said apparatus comprising:

server computer apparatus remote from and connectable to a client computer terminal via a computer network link for receiving a telephone call specifying message, said client computer terminal being responsive to input by said first party to generate said telephone call specifying message; and

a telephone call initiator controlled by said server computer apparatus for dialling via a public telephone network a first telephone call to said first party as specified by said telephone call specifying message and performing one of:

(i) dialling a second telephone call via said public telephone network to said second party as specified by said telephone call specifying message and connecting said first telephone call and said second telephone call; and

(ii) establishing a dialling ready telephone link to said public telephone network and connecting said first telephone call to said dialling ready telephone link such that said first party may dial a call to said second party.

12. Apparatus for establishing a telephone connection between a first party and a second party substantially as hereinbefore described with reference to the accompanying drawings.

The Patent Office

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Search Report under Section 17

Databases searched:

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UK Cl (Ed.O): H4K: KED; KER; KEX; KF42

Int Cl (Ed.6): H04M, H04Q

Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2 289 599 A (MITEL)	
A	WO 96/33583 A1 (EUROTEL)	
A	WO 94/28683 A1 (BT)	
A	US 5 438 616 (PEOPLES)	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.